AMENDMENTS TO THE CLAIMS:

The listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-26 (canceled).

Claim 27 (currently amended). An aortic catheter system for segmenting and selectively perfusing an aorta comprising:

(a) an elongated shaft having a proximal end and a distal end, said elongated shaft of sufficient length to be inserted into an ascending aorta and guided transluminally such that the distal end is positioned in a descending aorta when in an operative position;

(b) a flow control regulator positioned on said elongated shaft such that when said distal end is in the operative position said flow control regulator is capable of at least partially occluding the descending aorta;

(c) a perfusion pump;

(d) a proximal portion of said elongated shaft having a corporeal perfusion lumen and an arch perfusion lumen, said corporeal perfusion lumen having a proximal end [configured for connection to a] in fluid communication with said perfusion pump and dimensioned to support corporeal circulation and said arch perfusion lumen having a proximal end [configured for connection to a] in fluid communication with said perfusion pump and dimensioned to support arch circulation, said arch perfusion lumen terminating

as at least one or more arch perfusion ports proximate to a patient's arch vessels when said distal end is in the operative position; and

[(d)] (e) a distal portion of said elongated shaft extending beyond said proximal portion, terminating as at least one or more corporeal perfusion ports distal to said flow control regulator.

Claim 28 (currently amended). The aortic catheter system of claim 27, wherein said catheter shaft is from 4 and 30 cm in length.

Claim 29 (currently amended). The aortic catheter system of claim 27, wherein said corporeal perfusion lumen is connected to a 3/8 inch to 1/4 inch barb reducer for connection to a perfusion pump.

Claim 30 (currently amended). The aortic catheter system of claim 27, wherein said arch perfusion lumen is connected to a 1/4 inch barb connector for connection to a perfusion pump.

Claim 31 (currently amended). The aortic catheter system of claim 30, wherein said barb connector is coupled to a luer fitting for monitoring perfusion pressure.

Claim 32 (currently amended). The aortic catheter system of claim 29, wherein said barb reducer is coupled to a luer fitting for withdrawing fluid samples and injecting medications.

Claim 33 (currently amended). The aortic catheter system of claim 27, further comprising an actuation lumen, said actuation lumen having a proximal end coupled to an actuation source and a distal port in communication with said flow control regulator such that communication from said actuation source actuates said flow control regulator.

Claim 34 (currently amended). The aortic catheter system of claim 27, wherein said flow control regulator is a balloon.

Claim 35 (currently amended). The aortic catheter system of claim 34, wherein said balloon is made of a material selected from the group consisting of polymers and elastomers.

Claim 36 (currently amended). The aortic catheter system of claim 34, wherein said balloon has an inflated outer diameter of approximately 1.5 to 4.0 cm.

Claim 37 (currently amended). The aortic catheter system of claim 34, wherein said balloon has a radiopaque marker positioned within said balloon.

Claims 38-43 (canceled).

Claim 44 (currently amended). The aortic catheter system of claim 27, wherein said distal tip is configured to be temperature sensitive.

Claim 45 (currently amended). The aortic catheter system of claim 27, wherein said elongated shaft has a curvature configured to conform to a patient's aortic arch anatomy.

Claim 46 (currently amended). The aortic catheter system of claim 27, wherein said at least one arch perfusion port comprises approximately 1 to 16 external holes.

Claim 47 (currently amended). The aortic catheter system of claim 27, wherein said at least one corporeal perfusion port comprises approximately 1 to 8 external holes.

Claims 48-72 (canceled).